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DOWNY MILDEW OF CUCURBITS

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Downy mildew is a disease caused by a fungus* which attacks various cultivated cucurbits including the watermelon, citron, muskmelon, cantaloupe, cucumber, pumpkin, squash and gourd. During certain seasons the disease materially reduces the yields of these crops, being especially serious on cucumbers. It appears on plants of all ages and sizes but usually is most destructive during the picking season. During most seasons the first symptoms of the disease appear just before blossoming time and it develops very rapidly from that time until the vines are killed. However, under favorable weather conditions, the disease may appear at any time after the plants are two weeks old.

Vigorous, rapid-growing plants appear to be just as susceptible to infection as slow-growing, stunted ones. There appears to be no difference in resistance among commercial varieties of cucumbers. However, cucumbers may be killed, while squash or watermelon plants close by may escape with only severe spotting of the leaves. Gourds are often killed rapidly, while citrons may become infected but survive all summer. The only native plant found showing the disease is the wild creeping cucumber, *Melothria crassifolia* Small. This plant is well distributed in the woodlands throughout the state.

The fungus severely attacks only the leaves of the numerous cucurbits and the damage caused by it varies from only a slight yellow spotting on certain squashes and pumpkins to rapid killing of the leaves of cucumbers, cantaloupes and certain gourds. Spores are produced on the lower surface of these yellow spots in great abundance. These spores are scattered far and wide by the wind and from plant to plant by farming implements and laborers. They settle on the foliage of plants and germinate in the moisture supplied by dew, rain and fog. The germ tube of the spore grows into the leaf tissue, where the fungus establishes itself much like roots of seed plants grow into the soil, and within a few days the typical yellow spots begin to appear. The disease spreads most rapidly during periods of comparatively cool temperatures accompanied by heavy dews, rains and windy days.

* *Peronoplasmopara cubensis* (B. & C.) Clint.

SYMPTOMS

Young downy mildew spots are difficult to distinguish from the yellow spots resulting from other causes. When the spots are a week or 10 days old, however, slight magnification will often reveal the fungus on the lower side of the leaf in the center of the yellow spot. Before the dew has disappeared in the morning, these infected areas may be easily detected, because they appear as water-soaked spots in the leaf blade. On squashes and pumpkins the spots do not become as large as they do on cucumbers. On watermelon only slight yellowing occurs before the tissue is killed and becomes black, which makes it difficult to distinguish from anthracnose.

The spots may be few or many on a single leaf and the greater the number the more rapidly the leaves are killed, especially cucumber and cantaloupe. Squash is not so severely affected even though the spots are very numerous. These spots vary in size from barely distinguishable ones to those one-half inch in diameter. The spots increase rapidly in size, coalesce and the leaves die, turn brown and curl inward from the margins. Spores are produced in seven to 10 days after infection and when numerous, the spore masses, which are black, cause the spots to appear as though covered with very fine black earth particles. These spores are easily detached and because of their light weight and small size are carried considerable distances by the wind. If they come to rest on a leaf, they cause additional infections in 24 hours, provided moisture and temperature conditions are favorable for their germination.

CONTROL

None of the cultivated cucurbits has been found that is entirely immune to downy mildew, although certain degrees of resistance among the various species and varieties is manifest. Seed disinfection will not prevent the occurrence of this disease. Sanitation and rotation are good farming practices, but it is doubtful whether they have any effect on the prevalence of downy mildew.

The application of certain fungicides will control the disease under normal conditions. Applications should be made weekly from the time the first true leaves appear, or often enough to keep all parts of the plant covered.

A weak bordeaux 1-2-50 or 2-4-50 is preferred to stronger mixtures, and is sufficient to control the disease if properly applied.

Copper-lime dusts, 20-80 or 25-75, also are effective and should be applied at the rate of 15 to 30 pounds per acre per application, depending upon the size of the plants. The dust is about 20 percent less effective than the bordeaux spray but ease of application has made its use popular. In localities where the picking season is shorter than three weeks, two applications of fungicides, both made before blossoming begins, are usually sufficient. Sulfur stunts the plants and should not be used on cucumbers. In Florida a sprayed plant will not outyield a nonsprayed plant, when there is no disease present.